

WHAT IS CLAIMED IS:

1. An integrated method comprising:
providing a low dielectric material;
applying a first treatment altering a first property of the low dielectric material; and
applying a second treatment altering a second property of the treated low dielectric material and producing a lower dielectric material with better mechanical stability.
2. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with hydrogen-based plasma and then with microwave hydrogen plasma.
3. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with hydrogen-based plasma and then with electron beam.
4. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with hydrogen-based plasma and then with ultraviolet radiation.
5. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with high temperature and then with microwave hydrogen plasma.
6. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with high temperature and then with electron beam.

7. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with high temperature and then with ultraviolet radiation.

8. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with electron beam and then with carbon-based plasma.

9. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with ultraviolet radiation and then with carbon-based plasma.

10. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with microwave hydrogen plasma and then with hydrogen plasma.

11. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with microwave hydrogen plasma and then with carbon-based plasma.

12. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with electron beam and then with hydrogen-based plasma.

13. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with ultraviolet radiation and then with hydrogen-based plasma.

14. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with high temperature and then with hydrogen-based plasma.

15. The integrated method, as set forth in claim 1, wherein applying the first and second treatment comprise treating the low dielectric material with high temperature and then with carbon-based plasma.

16. The integrated method, as set forth in claim 1, wherein applying the first treatment comprises subjecting the low dielectric material to a treatment selected from a group consisting of hydrogen-based plasma, high temperature, electron beam, ultraviolet radiation, and microwave hydrogen plasma.

17. The integrated method, as set forth in claim 1, wherein applying the second treatment comprises subjecting the low dielectric material after the first treatment to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and carbon-based plasma, microwave hydrogen plasma.

18. The integrated method, as set forth in claim 1, wherein applying a first treatment comprises removing pore generators from the low dielectric material.

19. The integrated method, as set forth in claim 1, wherein applying a second treatment comprises strengthening the treated low dielectric material.

20. The integrated method, as set forth in claim 1, wherein applying a first treatment comprises lowering the dielectric constant of the low dielectric material.

21. The integrated method, as set forth in claim 1, wherein applying a second treatment comprises healing the treated low dielectric material.

22. A method comprising:
forming a low dielectric material;
applying an integrated curing process comprising at least two treatments, a first treatment altering at least a first property of the low dielectric material and a second treatment altering at least a second property of the treated low dielectric material; and
producing a lower dielectric material with better mechanical stability.

23. The method, as set forth in claim 22, wherein applying the first treatment comprises treating the low dielectric material with hydrogen-based plasma.

24. The method, as set forth in claim 23, wherein applying the second treatment comprises treating the hydrogen plasma-treated low dielectric material with microwave hydrogen plasma.

25. The method, as set forth in claim 23, wherein applying the second treatment comprises treating the hydrogen plasma-treated low dielectric material with electron beam.

26. The method, as set forth in claim 23, wherein applying the second treatment comprises treating the hydrogen plasma-treated low dielectric material with ultraviolet radiation.

27. The method, as set forth in claim 22, wherein applying the first treatment comprises treating the low dielectric material with high temperature.

28. The method, as set forth in claim 27, wherein applying the second treatment comprises treating the high temperature-treated low dielectric material with microwave hydrogen plasma.

29. The method, as set forth in claim 27, wherein applying the second treatment comprises treating the high temperature-treated low dielectric material with electron beam.

30. The method, as set forth in claim 27, wherein applying the second treatment comprises treating the high temperature-treated low dielectric material with ultraviolet radiation.

31. The method, as set forth in claim 27, wherein applying the second treatment comprises treating the high temperature-treated low dielectric material with hydrogen-based plasma.

32. The method, as set forth in claim 27, wherein applying the second treatment comprises treating the high temperature-treated low dielectric material with carbon-based plasma.

33. The method, as set forth in claim 22, wherein applying the first treatment comprises treating the low dielectric material with electron beam.

34. The method, as set forth in claim 33, wherein applying the second treatment comprises treating the electron beam-treated low dielectric material with carbon-based plasma.

35. The method, as set forth in claim 33, wherein applying the second treatment comprises treating the electron beam-treated low dielectric material with hydrogen-based plasma.

36. The method, as set forth in claim 22, wherein applying the first treatment comprises treating the low dielectric material with ultraviolet radiation.

37. The method, as set forth in claim 36, wherein applying the second treatment comprises treating the ultraviolet radiation-treated low dielectric material with carbon-based plasma.

38. The method, as set forth in claim 36, wherein applying the second treatment comprises treating the ultraviolet radiation-treated low dielectric material with hydrogen-based plasma.

39. The method, as set forth in claim 22, wherein applying the first treatment comprises treating the low dielectric material with microwave hydrogen plasma.

40. The method, as set forth in claim 39, wherein applying the second treatment comprises treating the microwave hydrogen plasma-treated low dielectric material with hydrogen-based plasma.

41. The method, as set forth in claim 39, wherein applying the second treatment comprises treating the microwave hydrogen plasma-treated low dielectric material with carbon-based plasma.

42. The method, as set forth in claim 22, wherein applying the first treatment comprises subjecting the low dielectric material to a treatment selected from a group consisting of hydrogen-based plasma, high temperature, electron beam, ultraviolet radiation, and microwave hydrogen plasma.

43. The method, as set forth in claim 22, wherein applying the second treatment comprises subjecting the low dielectric material after the first treatment to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and carbon-based plasma, microwave hydrogen plasma.

44. The method, as set forth in claim 22, wherein applying a first treatment comprises removing pore generators from the low dielectric material.

45. The method, as set forth in claim 22, wherein applying a second treatment comprises strengthening the treated low dielectric material.

46. A semiconductor device comprising:
a substrate;
conductive elements disposed above the substrate; and
a low dielectric material insulating the conductive elements from one another, the low dielectric material cured by an integrated method having at least two treatment processes to improve its mechanical stability and dielectric constant.

47. The semiconductor device, as set forth in claim 46, wherein the first treatment processes comprises subjecting the low dielectric material to a treatment selected from a group consisting of hydrogen-based plasma, high temperature, electron beam, ultraviolet radiation, and microwave hydrogen plasma.

48. The semiconductor device, as set forth in claim 46, wherein the second treatment processes comprises subjecting the low dielectric material after the first treatment to a treatment selected from a group consisting of hydrogen-based plasma, electron beam, ultraviolet radiation, and carbon-based plasma, microwave hydrogen plasma.